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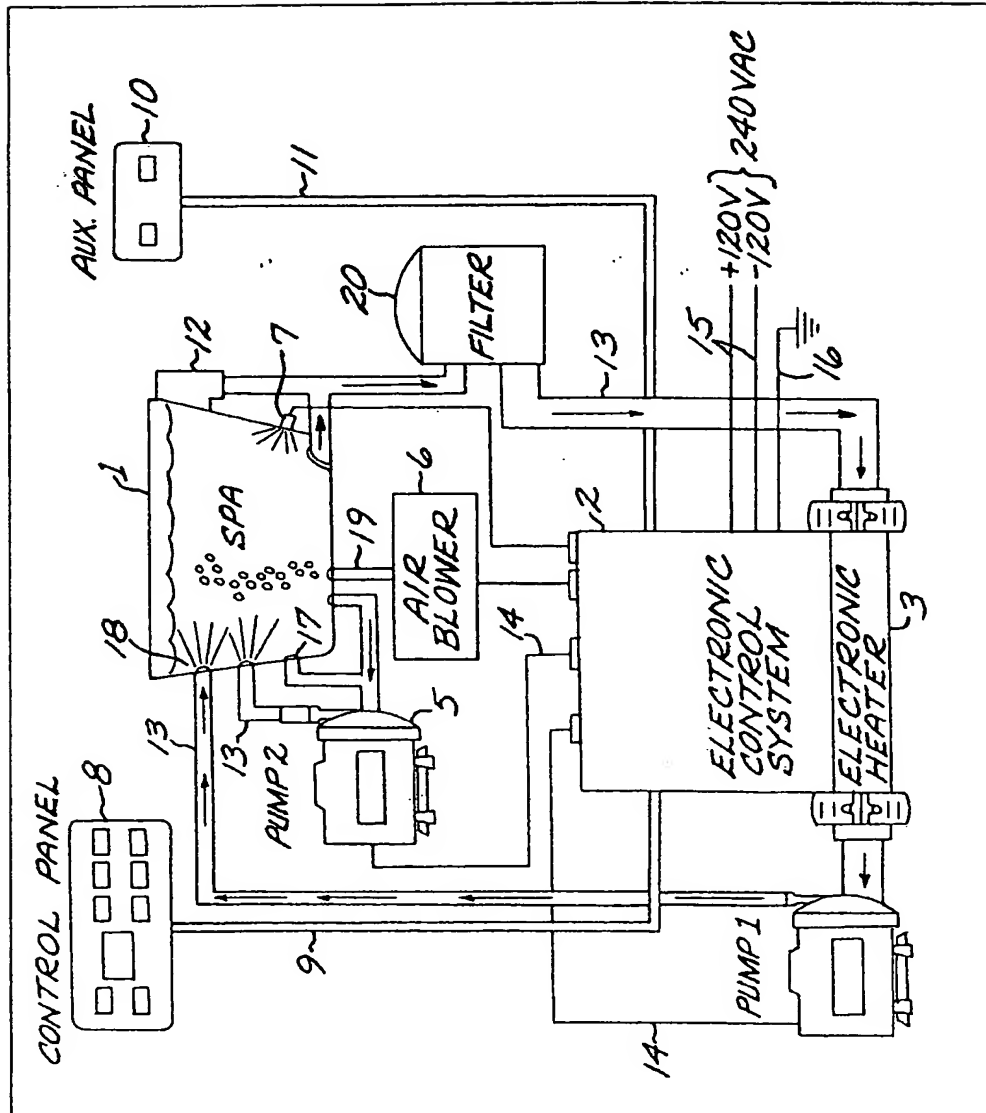
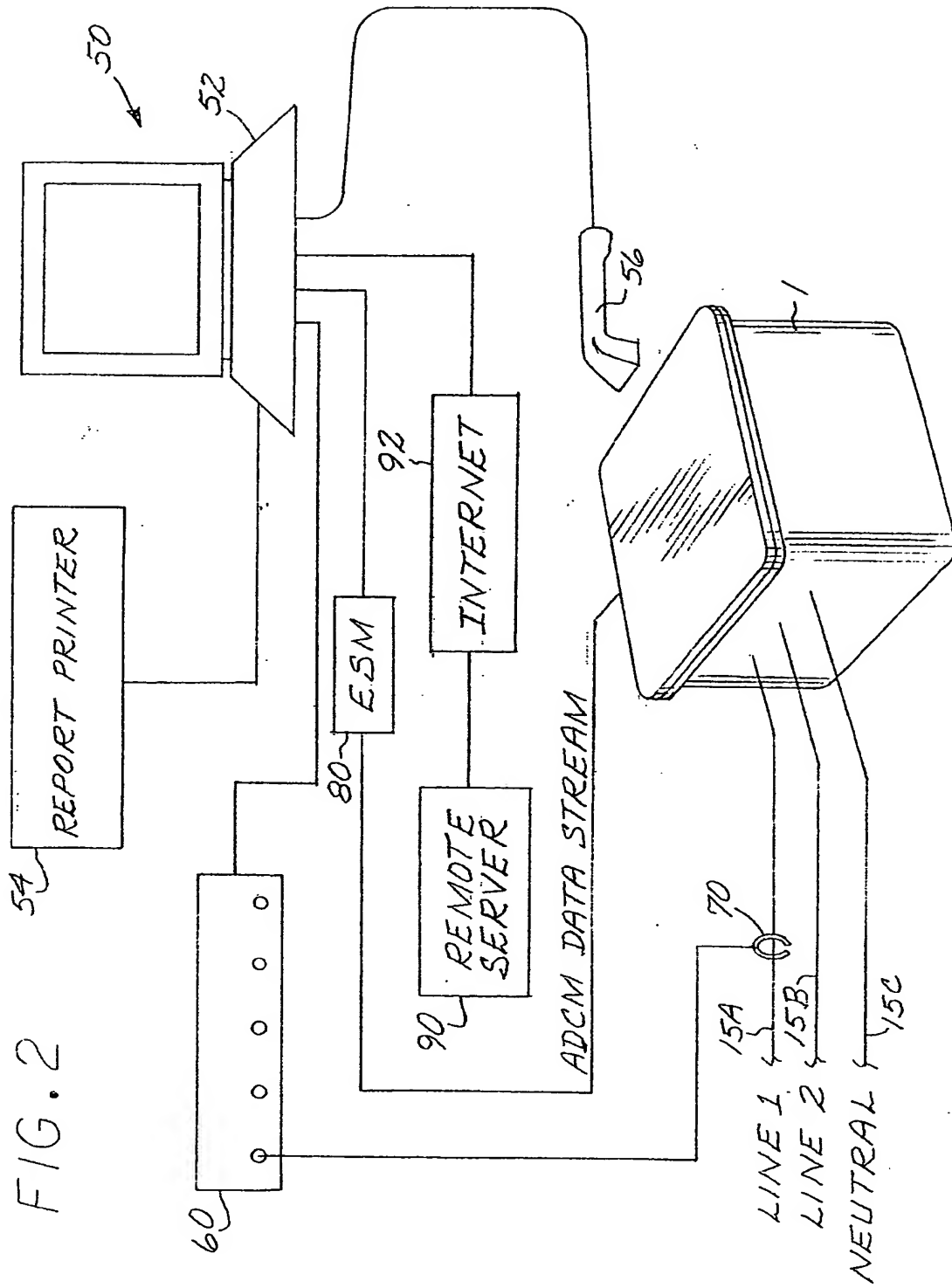


FIG. 1

FIG. 2



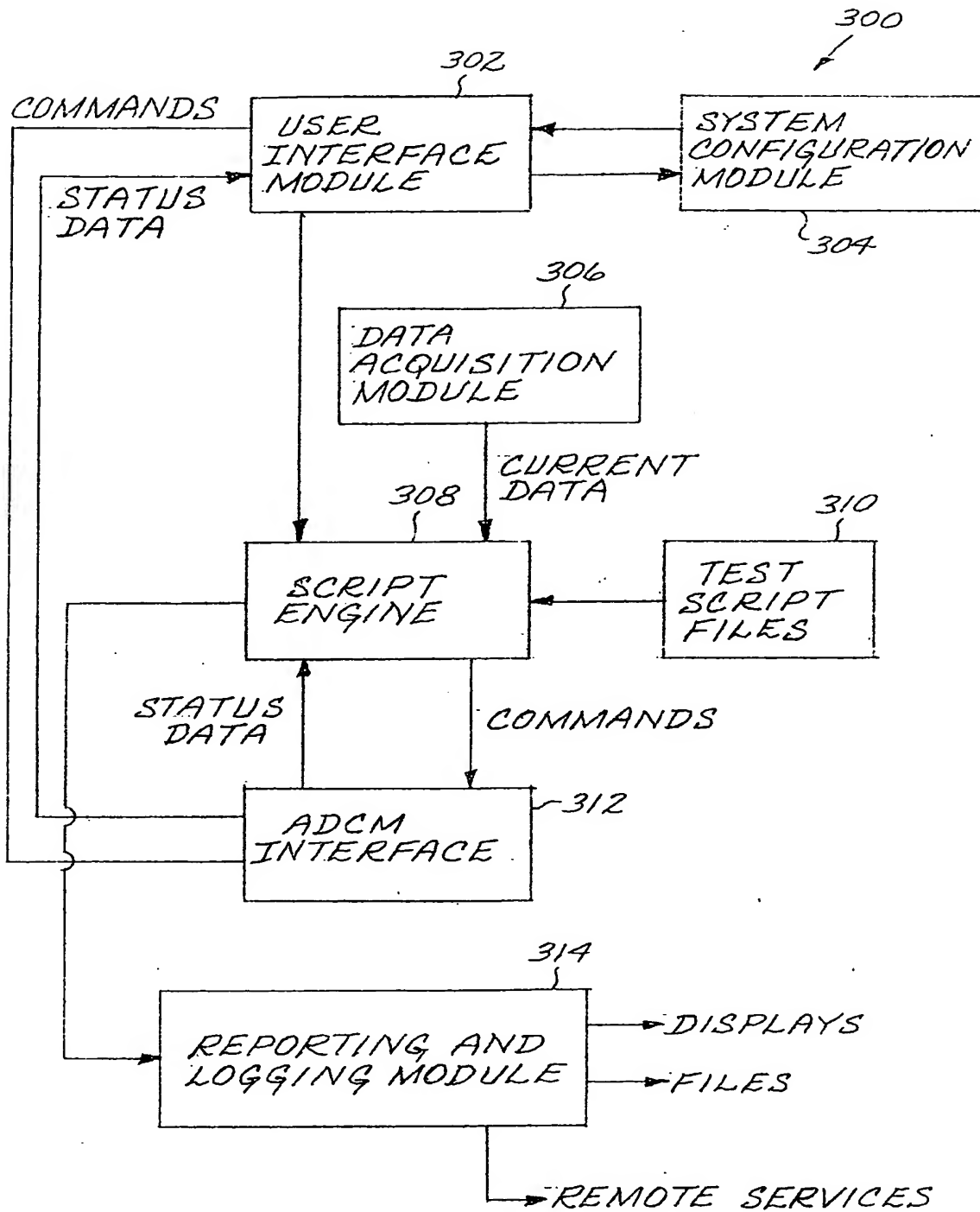


FIG. 2A

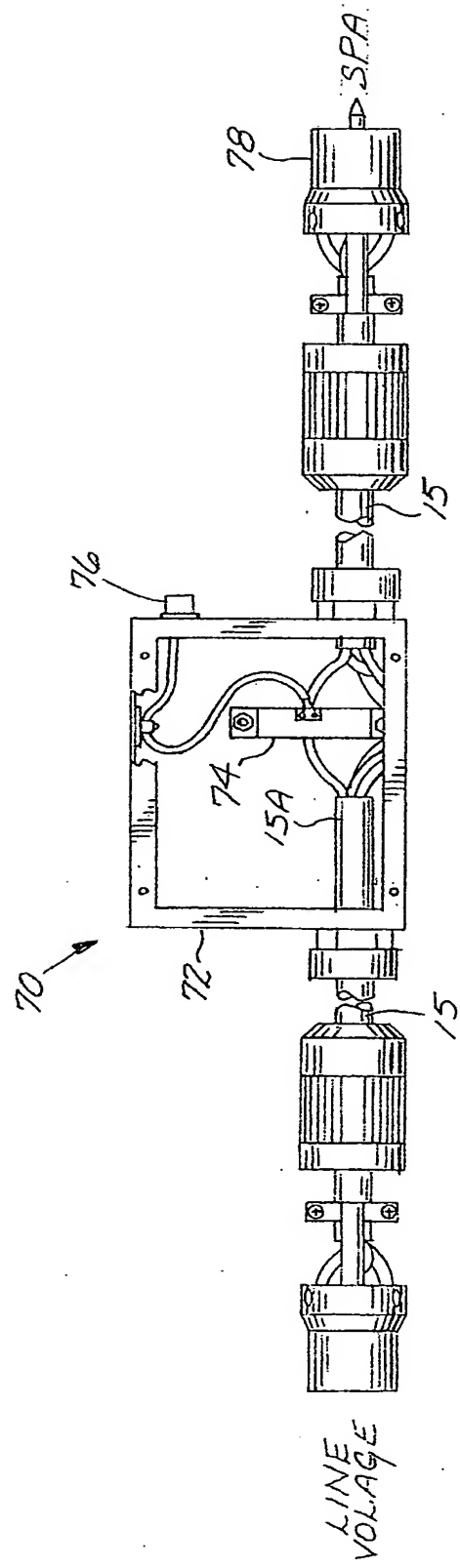


FIG. 3

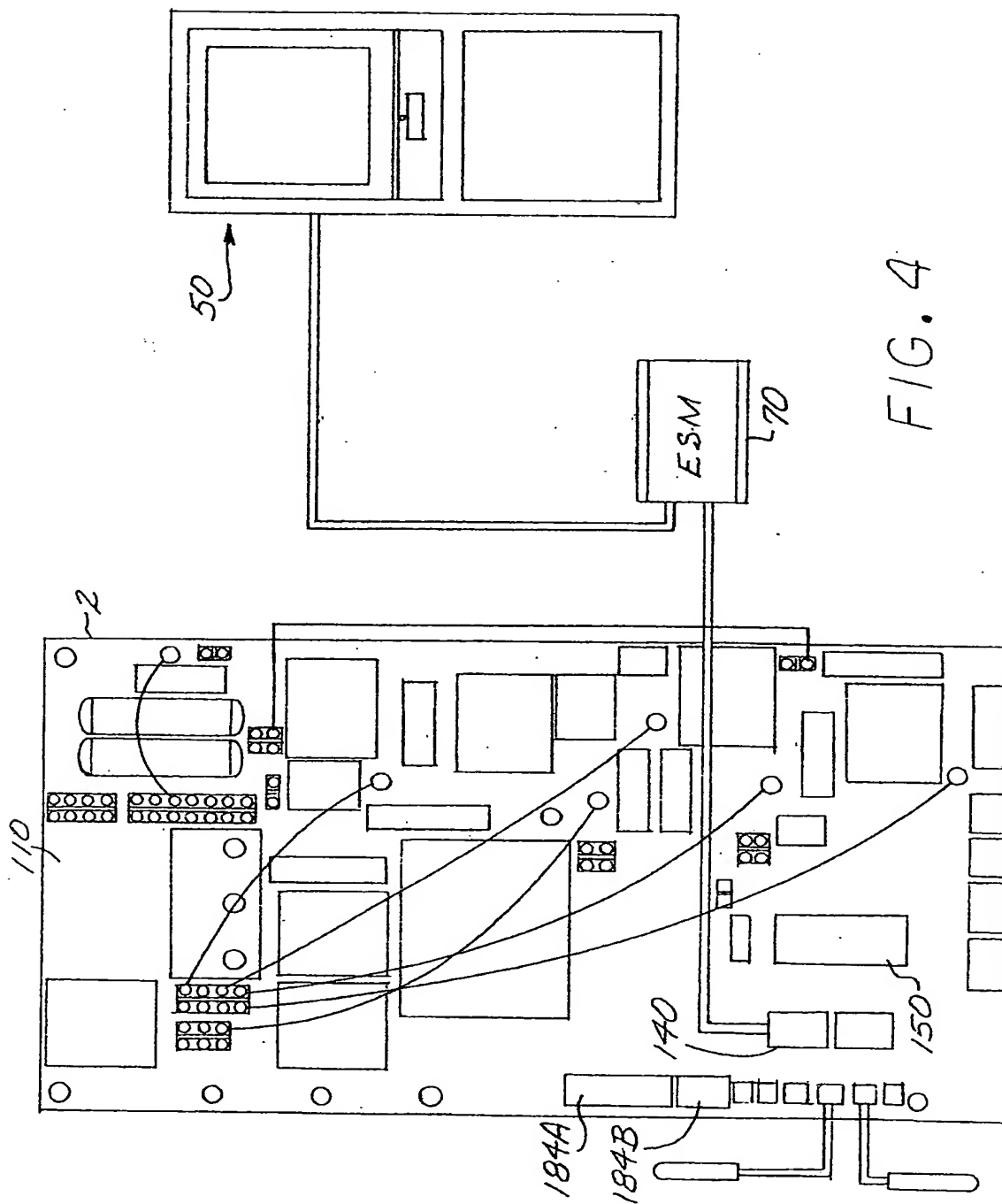


FIG. 4

FIG. 5A

FIG. 5B

'A' DIP SWITCH SETTINGS

ON	1	2	3	4	5	6	7	8	9	10	11	12
OFF	OFF	LOW AMP.	OFF	OFF	F°	15min 2HR	OFF	OFF	SEE TABLE ABOVE	OFF	OFF	OFF
ON	ON	HIGHT AMP.	ON	ON	C°	30min 4HR	ON	ON		ON	ON	ON
MODE	TEST MODE	AMPERAGE SELECT	FILTER PROG BY DURATION	TIME DISPLAY IN 24HR	DEG F°/C°	PUMP TIMEOUT PI-L TIMEOUT	CLEANUP CYCLE	O3 SUPPRESSED FOR 1 HR	CIRC.PUMP BEHAVIOR	CIRC.PUMP BEHAVIOR	CRIG. PI 1SPD NO. 03 IN FLTR	MEMORY RESET
ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

ALL UNUSED SWITCHES SHOULD BE OFF

'B' DIP SWITCH SETTINGS

ON	1	2	3	4	5	6
OFF	OFF	OFF	OFF	OFF	N/A	OFF
ON	ON	ON	ON	ON	N/A	ON
MODE	P-2 1SPD	P-2 ENABLE	BLOWER ENABLE	F.D. INSTEAD OF SPA LIGHT	N/A	PANEL BUTTON 'SCRUNCHING'
ON	ON	ON	ON	ON	N/A	ON
OFF	OFF	OFF	OFF	OFF	N/A	OFF

ALL UNUSED SWITCHES SHOULD BE OFF.

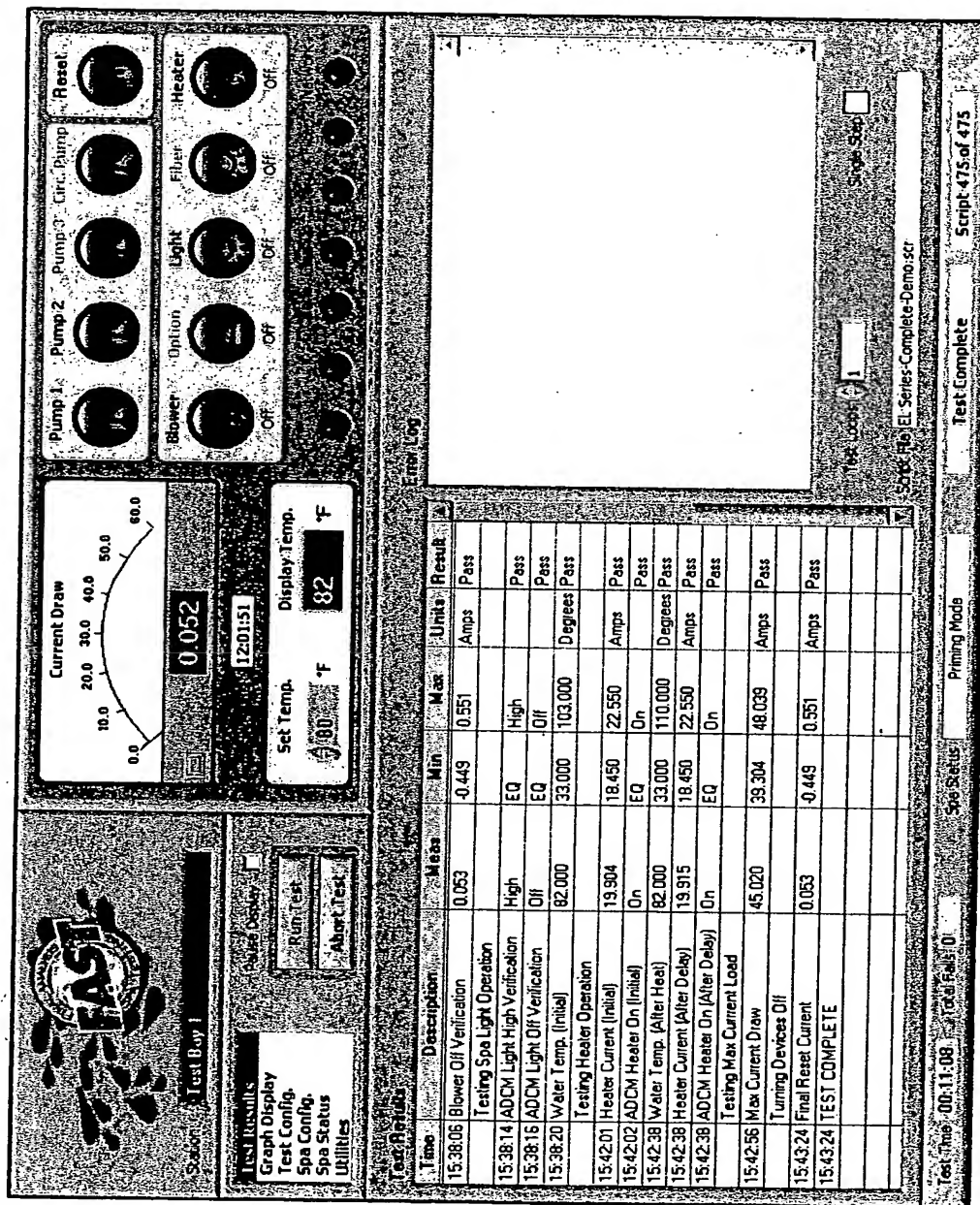


FIG. 6

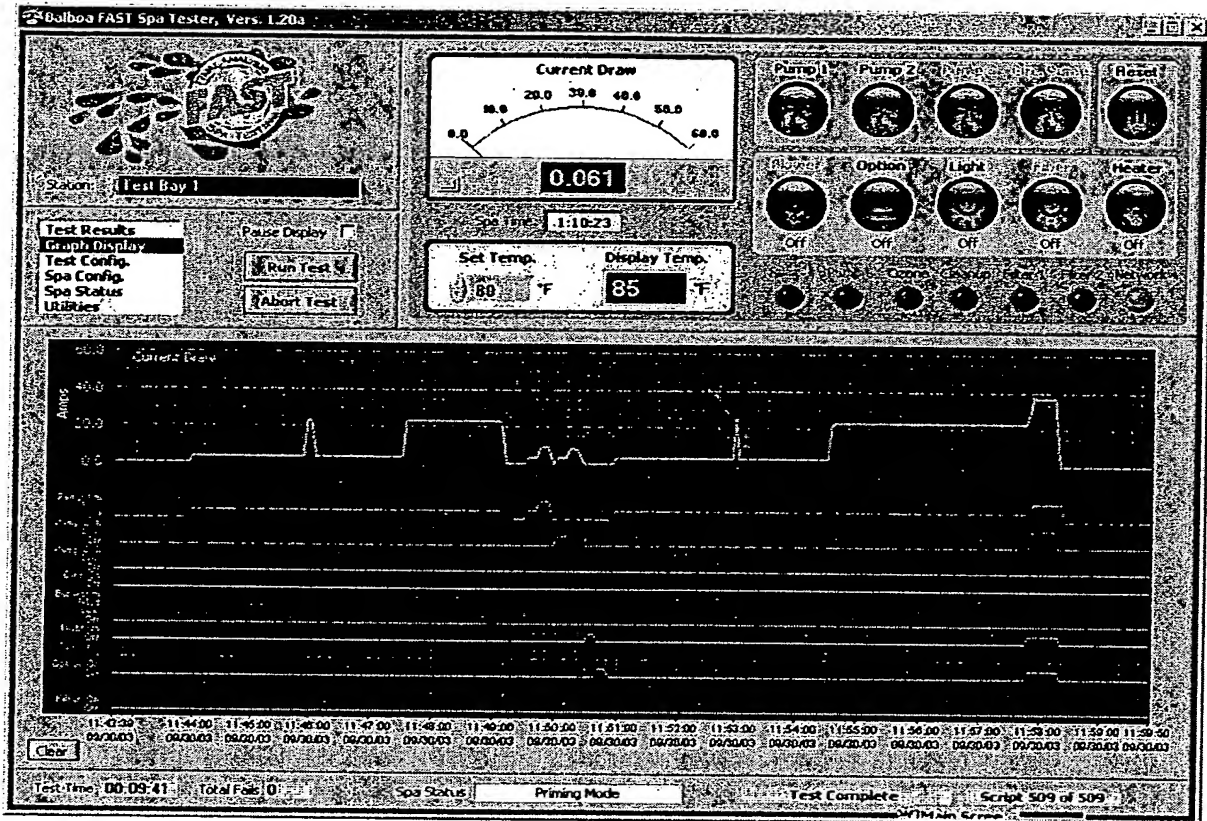


FIG. 7

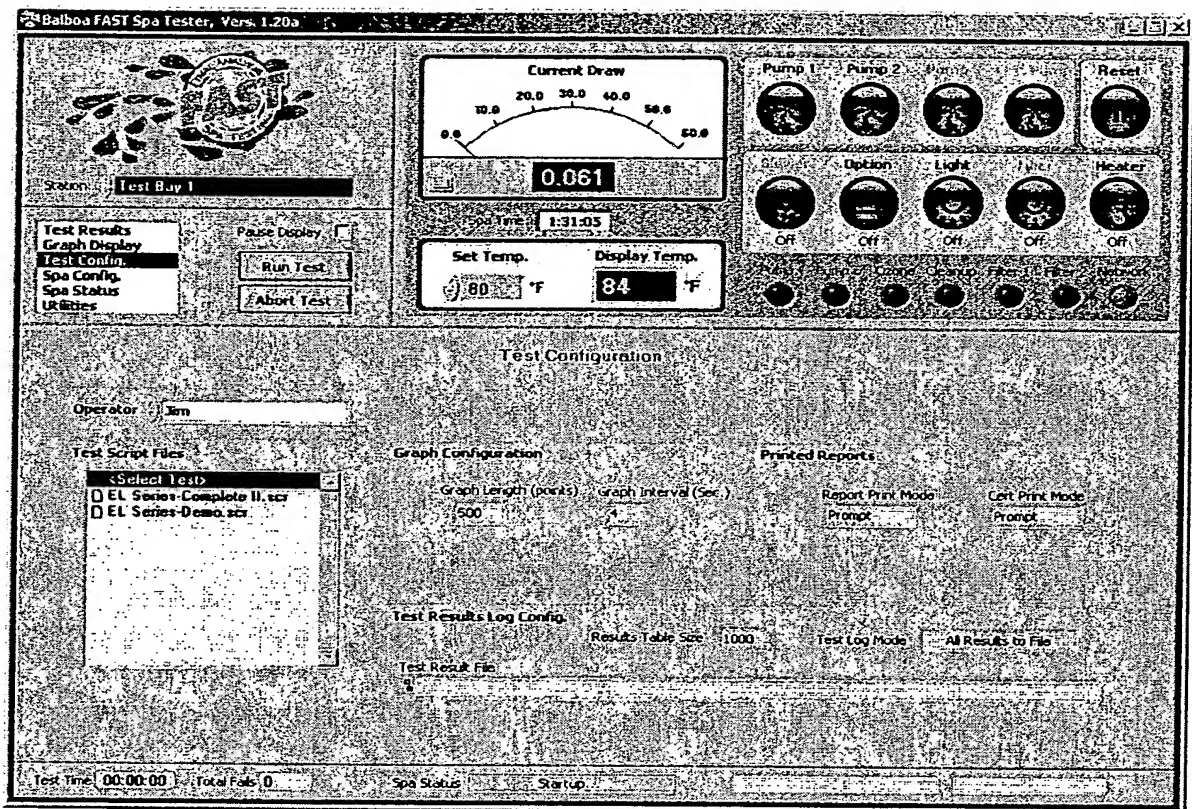


FIG. 8

Balboa FAST Spa Tester, Vers. 1.20a

Station: **Test Bay 1**

Test Results
Graph Display
Test Config
Spa Config
Spa Status
Utilities

Pause Display ☐

Run Test

Abort Test

Current Draw

2.95

Set Temp: 80 °F Display Temp: 78 °F

Spa Time: 21:52:15

Pump 1 Pump 2 Pump 3 Pump 4 Reset

Option Light Filter Heater

Off Off Off Off Waiting

Select the SPA Model, then enter Configuration and S/N data.

Revert Clear Reload Last Spa

Spa Model: ELB8000 Demo

Spa S/N: 12-44267-01

Spa Cabinet: Redwood/Elmwood

Tub Material: Acrylic

Tub Color: Jade

Comments:

Device Status	Model	S/N
Pump 1: 2-Speed	4HP-Dual Speed	58010-200306280033
Pump 2: 2-Speed	4HP-Dual Speed	52654-200306190002
Pump 3: None	None	
Pump 4: None	None	
Pump 5: None	None	
Circ. Pump: None	None	
Blower: None	None	
Opt./Mist: Option	None	
Spa Light: On/Off	LED Type	
Filter: None		
Main Panel: 8-Button (LCD)		12-44267-01
Ozone/Ox: None		
Heater: 5.5KW		E56869

Aux. Panels: 1

Selected Options:

- Spa Cover ☒
- Power Drain ☐
- Cover Lifts ☐
- Dura Steps ☐
- SpinClean ☒
- Aromatherapy Cartridges ☐
- LED Lighting System ☒

Test Time: 00:00:00 Total Fails: 0 Spa Status: Normal

FIG. 9

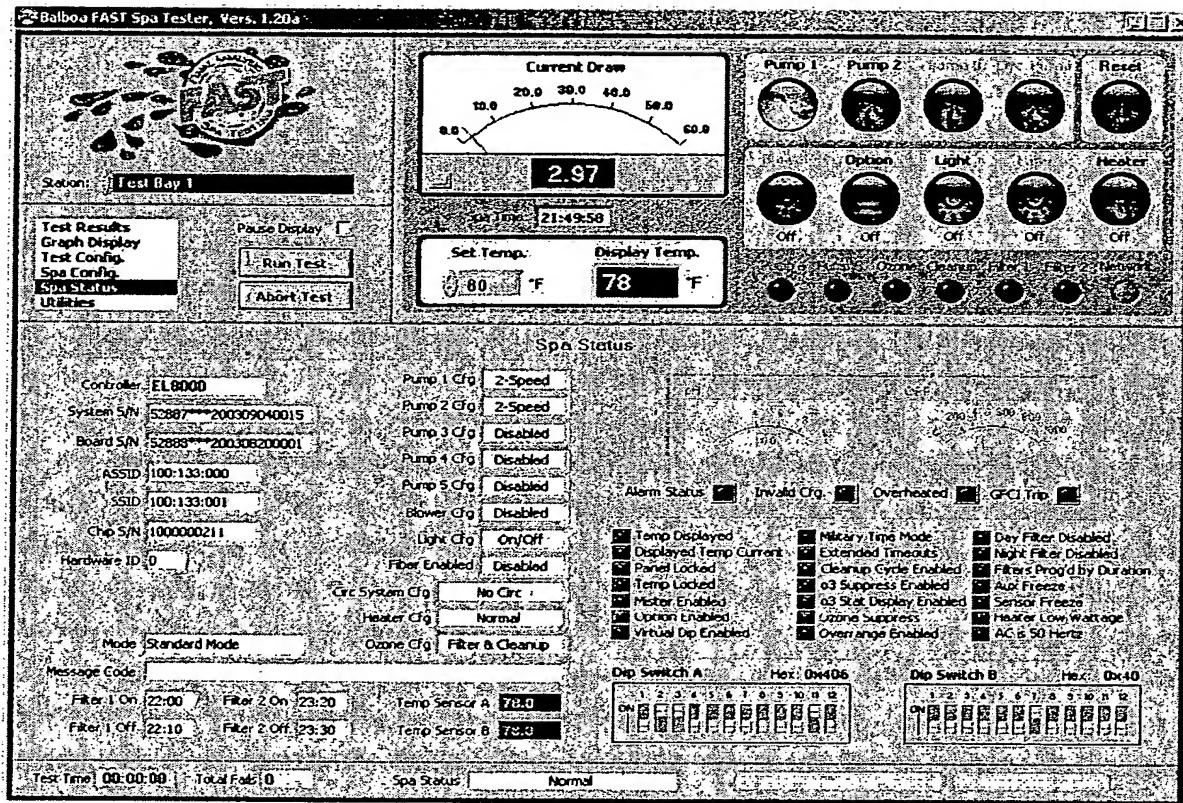


FIG. 10

Test Summary Viewer							
Summary Log File: C:\Copy of SpA Test\Test Results\Summary Log.txt							
Start Date: 05/02/03	End Date: 06/09/03	Today's Test Runs		Print Report			
Start Time: 00:00:00	End Time: 23:59:59	Selected Test Runs		Done			
		All Test Runs					
Total Runs: 153	Completed Runs: 72	Passed Units: 55	Failed Units: 98	% Yield: 35.9			
Date	Time	Spa Model	Spa S/N	Fault	Operator	Test Station	Test Completed
05/05/03	09:58:01			0	Operator 1	Test Bay 1	Test Aborted
05/05/03	14:06:31			1	Operator 1	Test Bay 1	Test Aborted
05/05/03	14:12:08		123456	3	Operator 1	Test Bay 1	Test Complete
05/05/03	14:31:11		123456	1	Operator 1	Test Bay 1	Test Aborted
05/06/03	12:11:03	Ultra 1000		0	Operator 1	Test Bay 1	Test Complete
05/06/03	12:12:36	Ultra 1000		0	Operator 1	Test Bay 1	Test Aborted
05/06/03	12:17:11	Ultra 1000		0	Operator 1	Test Bay 1	Test Aborted
05/06/03	12:21:30	Ultra 1000		0	Operator 1	Test Bay 1	Test Aborted
05/06/03	12:22:07	Ultra 1000		0	Operator 1	Test Bay 1	Test Complete
05/06/03	12:24:04	Ultra 1000		0	Operator 1	Test Bay 1	Test Complete
05/06/03	12:34:49	Ultra 1000		0	Operator 1	Test Bay 1	Test Complete
05/06/03	12:37:31	Ultra 1000		0	Operator 1	Test Bay 1	Test Complete
05/06/03	14:29:08			0	Operator 1	Test Bay 1	Test Complete
05/06/03	14:33:09			0	Operator 1	Test Bay 1	Test Aborted
05/08/03	11:50:53	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted
05/08/03	11:55:22	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted
05/08/03	11:57:02	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted
05/08/03	15:51:06	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted
05/08/03	15:53:08	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted
05/08/03	15:54:34	Ultra 5000		0	Operator 1	Test Bay 1	Test Aborted

FIG. 11A

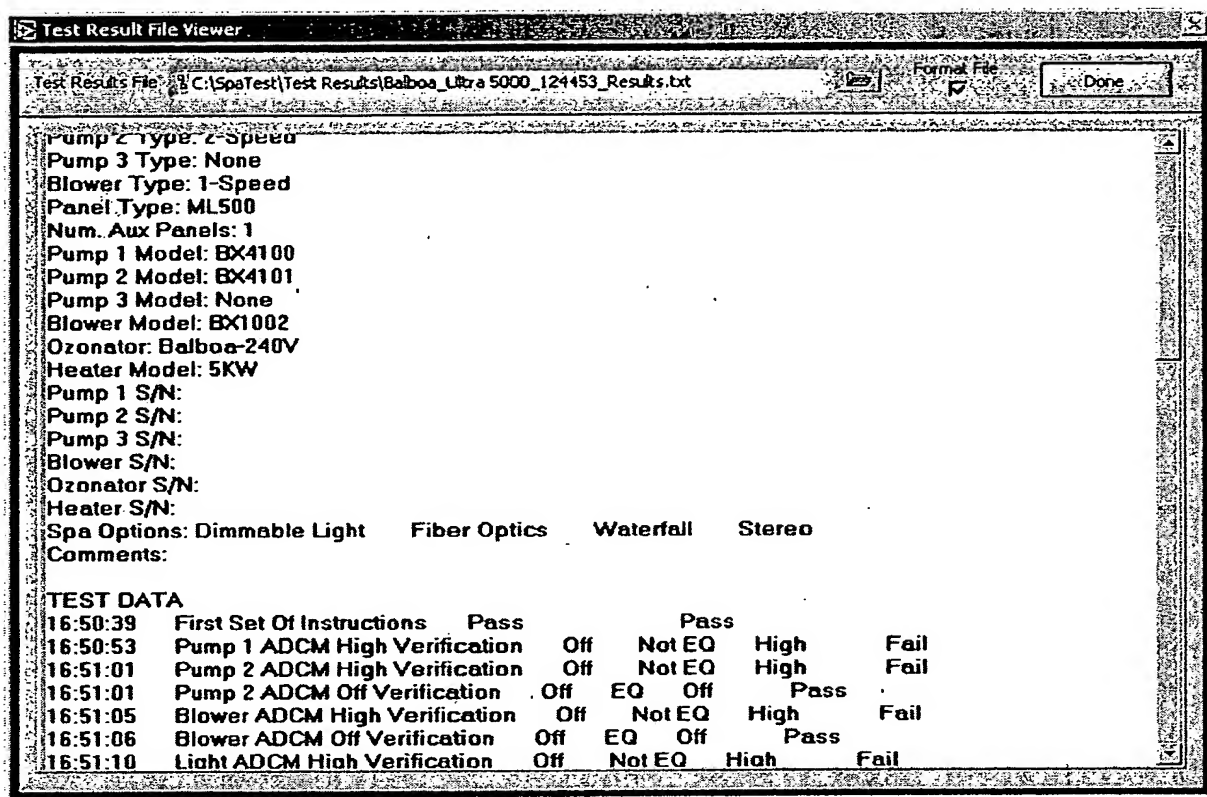


FIG. 11B

FAST Station Results

Result: **PASS**

Spa Model:	Ultra-2000	Exterior Color:	Grey	Test Station:	15
Serial Number:	0012345	Tub Material:	Red	Script File:	DemoQ212-No System
Date Tested:	02/06/36 23:42:52	Tub Color:		Total Fails:	0

Time	Meas Name	Measurement	Min	Max	Result
23:35:08	First Set Of Instructions	Pass			Pass
23:35:08	*** Start of Test ***				
23:35:33	Pump 1 ADCM High Verification	High	EQ	High	Pass
23:35:51	Pump 2 ADCM High Verification	High	EQ	High	Pass
23:36:04	Pump 2 ADCM Off Verification	Off	EQ	Off	Pass
23:36:18	Blower ADCM High Verification	High	EQ	High	Pass
23:36:20	Blower ADCM Off Verification	Off	EQ	Off	Pass
23:36:28	Light ADCM High Verification	High	EQ	High	Pass
23:36:31	Light ADCM Off Verification	Off	EQ	Off	Pass
23:36:39	Fiber ADCM High Verification	Fiber+Wheel	EQ	Fiber+Wheel	Pass
23:36:48	Fiber ADCM Off Verification	Fiber	EQ	Fiber	Pass
23:36:56	Fiber ADCM On Verification	Off	EQ	Off	Pass
23:36:56	Heater ADCM On Verification	On	EQ	On	Pass

FIG. 11C

FAST Station Results

Spa Model:	Ultra-2000	Exterior Color:	Grey	Test Station:	15	Result:	FAIL
Serial Number:	0012345	Tub Material:	Red	Script File:	Demo0218.txt		
Date Tested:	02/06/36 23:34:31	Tub Color:		Total Fails:	7		

Time	Meas Name	Measurement	Min	Max	Result
23:30:51	Dip Switch A check	8	EQ	6	Pass
23:30:51	Dip Switch B check	CE	EQ	CE	Pass
23:30:57	First Set Of Instructions	Pass			Pass
23:30:57	*** Start of Test ***				
23:31:31	Pump 1 High Current	0.000 Amps	11.320	13.320	Fail **
23:31:31	ADCM Pump 1 High Verification	High	EQ	High	Pass
23:31:54	Pump 2 Low Current	0.000 Amps	3.000	4.000	Fail **
23:31:54	ADCM Pump 2 Low Verification	Low	EQ	Low	Pass
23:32:19	Pump 2 High Current	0.000 Amps	7.000	9.000	Fail **
23:32:20	ADCM Pump 2 High Verification	High	EQ	High	Pass
23:32:28	ADCM Pump 2 Off Verification	Off	EQ	Off	Pass
23:32:48	Blower High Current	0.000 Amps	3.000	5.000	Fail **
23:32:48	ADCM Blower High Verification	High	EQ	High	Pass
23:32:50	ADCM Blower Off Verification	Off	EQ	Off	Pass
23:32:59	ADCM Light High Verification	High	EQ	High	Pass
23:33:01	ADCM Light Off Verification	Off	EQ	Off	Pass
23:33:11	Fiber Wheel Current	0.000 Amps	1.000	1.800	Fail **
23:33:11	ADCM Fiber Wheel Verification	Fiber Wheel	EQ	Fiber Wheel	Pass
23:33:20	ADCM Fiber Only Verification	Fiber	EQ	Fiber	Pass
23:33:29	ADCM Fiber Off Verification	Off	EQ	Off	Pass
23:33:31	Heater Current	0.000 Amps	18.000	20.000	Fail **
23:33:32	ADCM Heater On Verification	On	EQ	On	Pass
23:33:58	Water Temp @98	74.000 degrees	97.250	98.750	Fail **
23:34:26	TEST COMPLETE				

FIG. 11D

Pass Certificate

Certificate of Verification

Date Tested: Wed, Feb 06, 2036

Spa Information

Spa Model: Ultra-2000 Spa S/N: 0012345

Spa Features

Exterior Color: Grey Pump 1: 2-Speed
Tub Material: Red Pump 2: 2-Speed
Tub Color: Blower: 1-Speed
Options: Ozone, Waterfall, Stereo, Television, Dimmable Light, pH/ORP
Sensor, Mister, Fiber..

*We are proud of the trademark, outstanding quality, and the ultimate
performance built into every Spa.*

We hope you will enjoy your spa for many years to come.

Signed,

John L. Smith

John L. Smith, Director

FIG. 11E

User Configuration Utility

Spa Configurations Device Ratings Colors & Options User Profile

Spa Cabinets	Spa Tub Colors	Spa Ctrl. Panels	Special Options
Cedar Stain	Galaxy Green	ML500	1 Waterfall
Maple Stain	Caribbean	ML700	2 Stereo
Gray Stain	Seaspray	ML900	3 Chemical Dispenser
	Flourescent Pink		4 Skimmer
	Purple-ish Green		5 Fountain of Youth
			6
			7
			8
			9
			10
			11
			12
			13
			14

Tub Materials

Acrylic
Fiberglass

Right Click on a Table to Insert or delete Rows.
 Never Insert or delete Columns.
 Select the same number of Cells for paste as were copied, or columns will be inserted.

File Rev. Date: 9/18/2003 2:24 PM Revert File Save to File Exit

FIG. 11F

User Configuration Utility

Spa Configurations Device Ratings Colors & Options User Profile

Pump Ratings

Pump Model	Low	High
BX4101	4.00	8.00
BX4102	6.00	10.00
BX4103	8.00	12.00
Century	3.00	8.00
Pump 4 Model	0.00	0.00
Pump 5 Model	0.00	0.00

Blower Ratings

Blower Model	Low	Med	High
BX1002	2.50	5.00	8.00
BX1004	4.50	8.00	11.00
BX1006	6.50	9.00	13.00
BX1008	7.50	10.00	14.00
BX10010	8.50	12.00	14.00
Mark	2.10	2.90	3.50

Option/Mister Ratings

Option	Amps
ACME Mister Pump	2.25
ACE Mister Pump	1.75
User Device1	5.00
User Device2	10.00

Important: 1. For single speed pumps, specify current in the High column, and set Low value to 0.0.
2. For single speed blowers, specify High. For Two-speed blowers specify High and Low currents.

Circ. Pump Ratings

Circ. Model	Amps
CIRC_Pump 1	1.00
CIRC_Pump 2	2.50
Century Circ	4.40

Heater Ratings

Heater Model	Amps
5.5KW	20.50
4.0KW	16.00

Ozonator Ratings

Ozonator Model	Amps
Balboa-120V	5.50
Balboa-240V	7.50
BrandX	11.50

Fiber Ratings

Fiber System	Fiber	Wheel
Bulb Type	0.00	0.00
LED Type	0.40	1.10

Spa Light Ratings

Light Type	Low	Med	High
Incandescent	0.05	0.10	0.20
LED Type	0.03	0.09	0.15

Hints:
 Right-Click on a Table to insert or delete Row.
 Never insert or delete Columns.
 Select the same number of Cells for paste as were copied, or columns will be inserted.

File Rev. Date: 9/26/2003, 1:57 PM

FIG. 11G

FIG. 11H

Time	Description	Meas	Min	Max	Units	Result
15:48:34	Blower High Current		3600	4,400	Amps	Fail

Optical

Off

Pump 1

Off

Overheat

Off

Alarm

Off

Current Draw

0.1

Sec Temp

80.00

Blower

High

Spa Mode

Standard

Spa Time

1:00:41.3

Spa Mode

Standard

Display Temp

82.00

Sensor B

82.00

Input Voltage

0.0

Sensor A

82.00

PRIMING MODE TAKES 4 MIN

Diagnostic Msgs:
Spa Status at Failure

Time	Description	Meas	Min	Max	Units	Result
15:48:34	Blower High Current		3600	4,400	Amps	Fail

Optical

Off

Pump 1

Off

Overheat

Off

Alarm

Off

Current Draw

0.1

Sec Temp

80.00

Blower

High

Spa Mode

Standard

Spa Time

1:00:41.3

Spa Mode

Standard

Display Temp

82.00

Sensor B

82.00

Input Voltage

0.0

Sensor A

82.00

PRIMING MODE TAKES 4 MIN

Diagnostic Msgs

Spa Status at Failure

Diagnostic Messages

The Blower may not be connected properly to the controller board.
The Blower may be defective.

FIG. 12